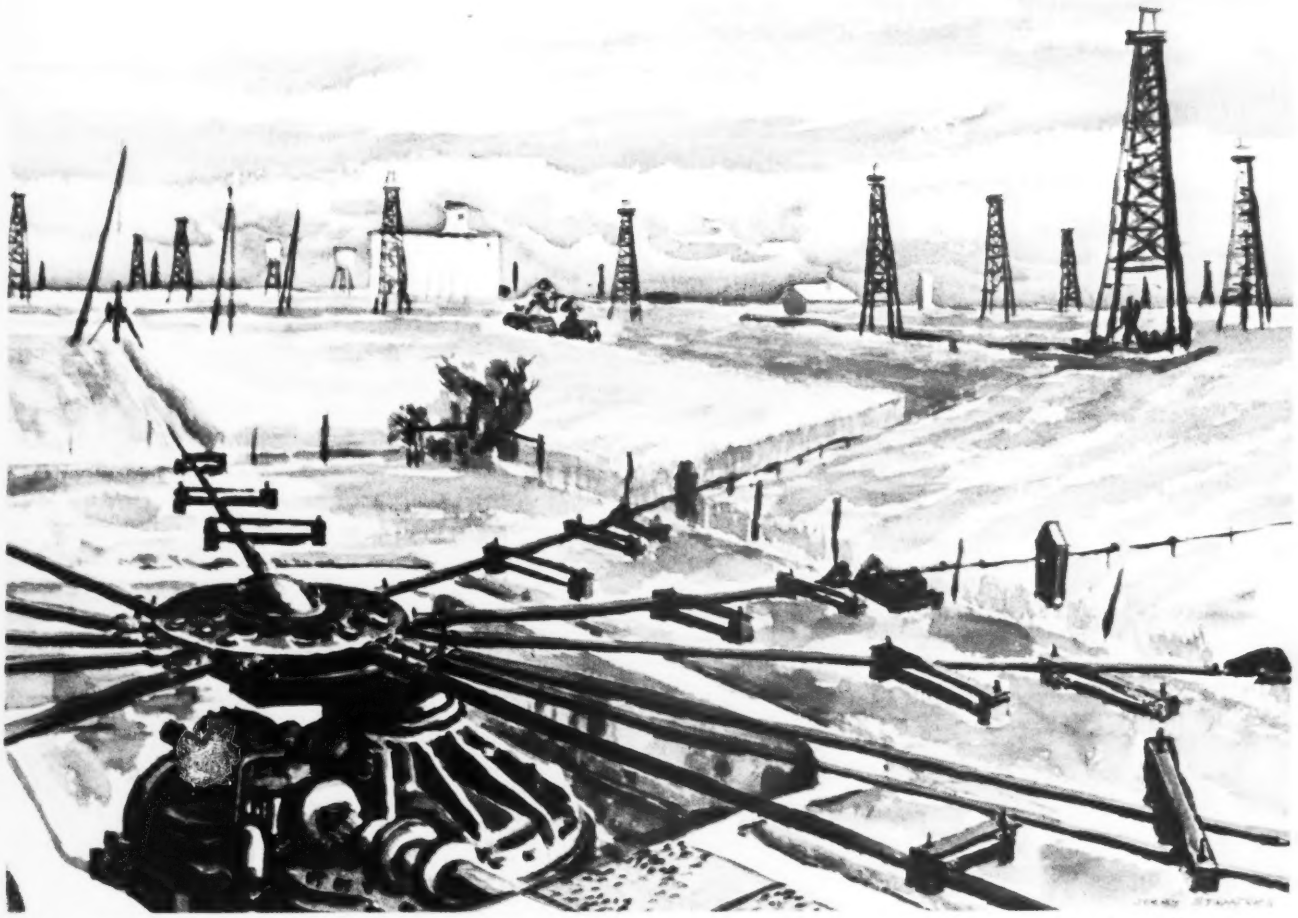


Power and Wheat — *by Jerry Bywaters*

The HUMBLE WAY

SEPTEMBER - OCTOBER, 1949

The HUMBLE WAY

SEPTEMBER-OCTOBER, 1949
VOL. V NO. 3

OIL INDUSTRY REVIEWS 90 YEARS OF PROGRESS

THE "Forty-niners," in their westward trek for gold, unknowingly passed a resource that was destined to become more important than all other mineral resources combined. This resource was oil, discovered ten years later in Pennsylvania. Since 1859, the material and social progress of the United States and the oil industry have been inseparably related. This year, the oil industry celebrated its 90th anniversary during Oil Progress Week, October 16-22.

Especially in the twentieth century has petroleum become an indispensable part of our way of life. Oil and gas now furnish half of all energy requirements in the United States, compared with only 6.4 per cent in 1900.

The United States uses about two billion barrels of liquid petroleum fuels a year, or nearly two-thirds of the world's consumption. This oil does many useful services for us at low cost—it drives 41 million motor vehicles providing a transportation system with benefits of quick, convenient, and individual service; and it provides fuel for almost four million centrally heated homes and about six million space heaters. Petroleum also furnishes power and lubricants for industry and farming—for railroads, ships, plants, and heavy machinery. Among useful products made from oil and gas are synthetic rubber, wax, face creams, medicines, plastics, and many others in a long list.

Oil Progress Week is a national observance set aside to acquaint Americans in every town and city with these facts and the oil industry's operations and advances. Oil companies demonstrated specific aspects of progress by inviting the public to their plant. Advancements in the many operations of the industry as well as contributions of oil and gas to progress of other parts of American living were pointed out. Through all communication media—radio, magazines, newspapers, and word of mouth—members of the industry presented the story of petroleum progress on the 90th year of the oil business in the United States.

The story of petroleum progress is the story of progress in America. The United States has produced about two-thirds of the world's petroleum even though its ultimate potential oil resources are considered to be a much smaller fraction.

Since the first oil well was drilled to 69½ feet, more than one and a quarter million oil and gas wells have been drilled. Drilling technology and equipment have improved so that wells can be drilled more than 20,000 feet below the earth's surface.

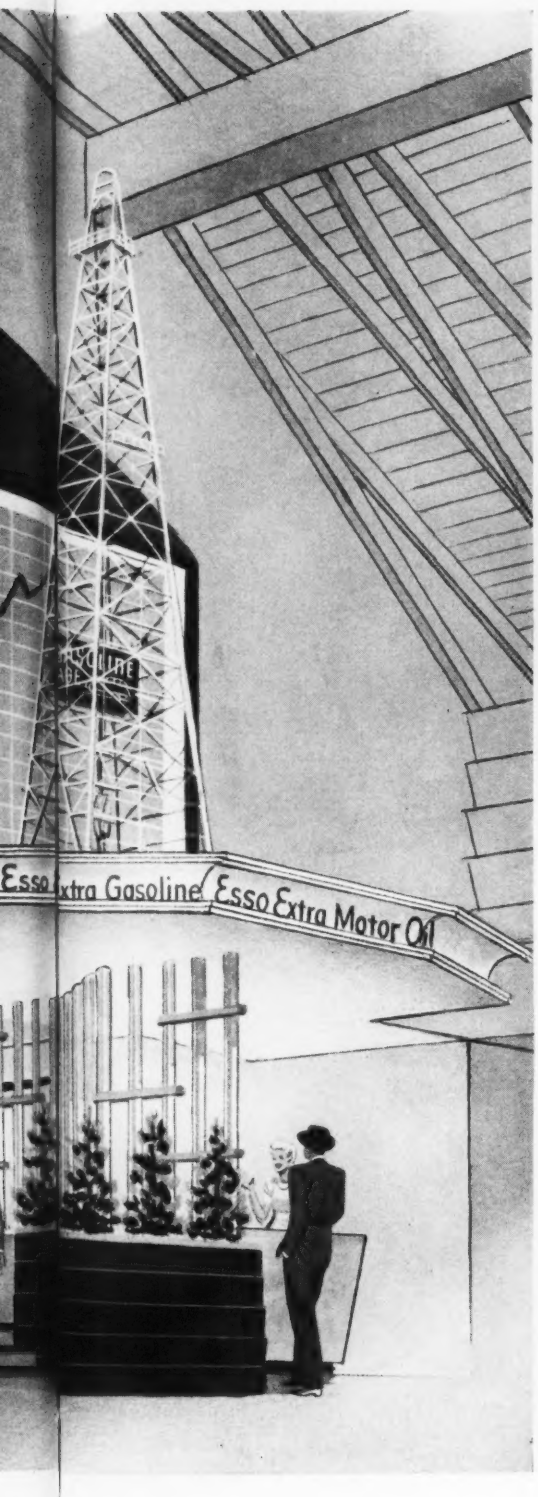
Equal accomplishments can be cited for all aspects of the industry. Exploration methods, improving with the growth of the oil business, have enabled it to find fields on the continental shelf along the coast of Texas and Louisiana. Production research has developed rigs that drill

(Continued on Page 3)

Thin sections of rock, only 3/100 of a millimeter thick, are required for microscopic examination by the Geologic Research Section. The rock samples are cut one to two millimeters thick and then are polished to about one-half the thickness of this printed page. In the cutting operation at left, samples are held by a groove in the metal bar on the left side of the diamond-impregnated cutting wheel.

Humble's State Fair of Texas Exhibit Salutes Oil Progress

At the State Fair of Texas held in Dallas October 7-23, hundreds of thousands of people saw the Humble exhibit which depicted oil's progress through the kerosene age, the fuel oil



age, and the gasoline age. Inside the 100-seat theater, a movie of 1948 Southwest Conference football highlights was shown between appearances of an organist playing request numbers.

Modern grain combines, fueled and lubricated by petroleum products, reflect the advancements in farming methods and tools since the days of the early thresher.

Today's service stations are amply supplied with petroleum products and accessory items for the motorist; quite a contrast with the service station of 25 years ago.

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deeper and deeper, wherever exploration locates prospective structures. Today America has 150,000 miles of oil pipe lines and more than 240,000 miles of gas lines. Added to this extensive pipe line system of transportation are hundreds of railroad tank cars, oil trucks, barges, and sea-going tankers. Research and development in refining have made it possible to produce larger proportions of the more desirable products from a barrel of crude oil and to improve the quality of all the products. Marketers have established several hundred thousand stations to provide a convenient supply of gasoline wherever Americans drive.

In the matter of oil progress, no single achievement is as great as that of conservation. Its practice has enabled the oil business to recover a larger quantity of oil from producing sands; have less waste at the surface; lower investments in wells, storage, and other equipment; lower prices to consumers; provide steady employment; produce sufficient quantities of oil to meet the demands of an industrialized economy; and develop reserves for future use and national emergencies.

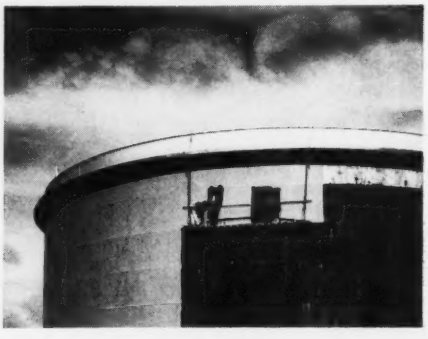
Proved oil reserves stand today at their highest peak in history. Yet, the industry continues to pioneer in the search for petroleum and in all branches of the business. Oil companies are spending $100,000,000 a year on research alone. Huge investments continue to be made, to keep the industry moving ahead in its effort to supply more and better products for public use.

In acquainting each community with these facts and many others during Oil Progress Week, the industry outlined the history of its first 90 years. It has shown how closely oil progress is tied to national progress. With their efforts supported and guided by a desire to promote the public interest and welfare, members of the industry confidently look forward to future accomplishments in keeping with those of the past 90 years.

Pneumatic buffing removes old paint scales and rust from surface of tank hull. Below, RUST-BAN 281 or Quick Drying Red Lead Primer 272 coating is brushed on.

PAINT JOB...

for looks and longer life



IF YOU have touched up woodwork around home, perhaps have even painted the whole house on occasion, you know how much work and paint it takes. Eight gallons of paint and 100 man hours is about average for a two-coat job on a five-room house.

But even that job is small in comparison with the painting of a storage tank at one of Humble Pipe Line Company's tank farms. An 80,000-barrel floating roof tank, for example, requires about 936 man hours and 356 gallons of assorted Humble RUST-BAN coatings, because there are approximately 70,000 square feet of surface to cover. That is just one tank; Humble Pipe Line Company has 750 of them in 1,000 to 140,000 barrel sizes, and paints 75 to 100 of them every year. So it adds up to a lot of work and a lot of paint—so much, in fact, that the services of a crew of men are needed to see that painting comes up to a protective standard.

In addition to making tank farms attractive, there are two more important reasons for painting tanks. One is to resist corrosion, and the other is to reduce evaporation. The worst corrosion conditions are found in the Texas coastal area from Rockport to about 50 miles south of Corpus Christi. There restless trade winds make the atmosphere so salty that a paint job lasts only about six years. Over most of the rest of the state, paint jobs last from 10 to 15 years.

Evaporation losses are reduced an estimated 600 barrels per tank a year

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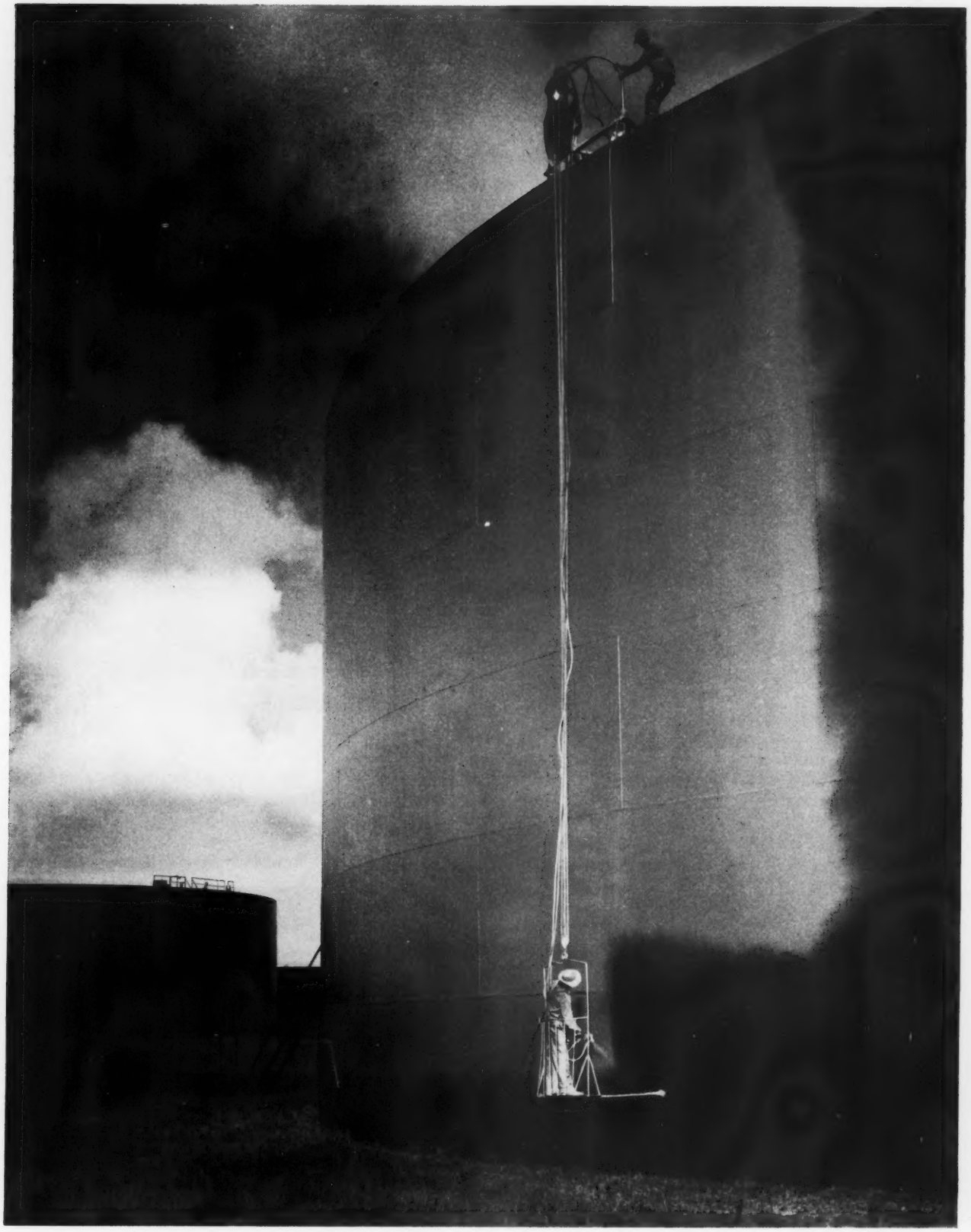
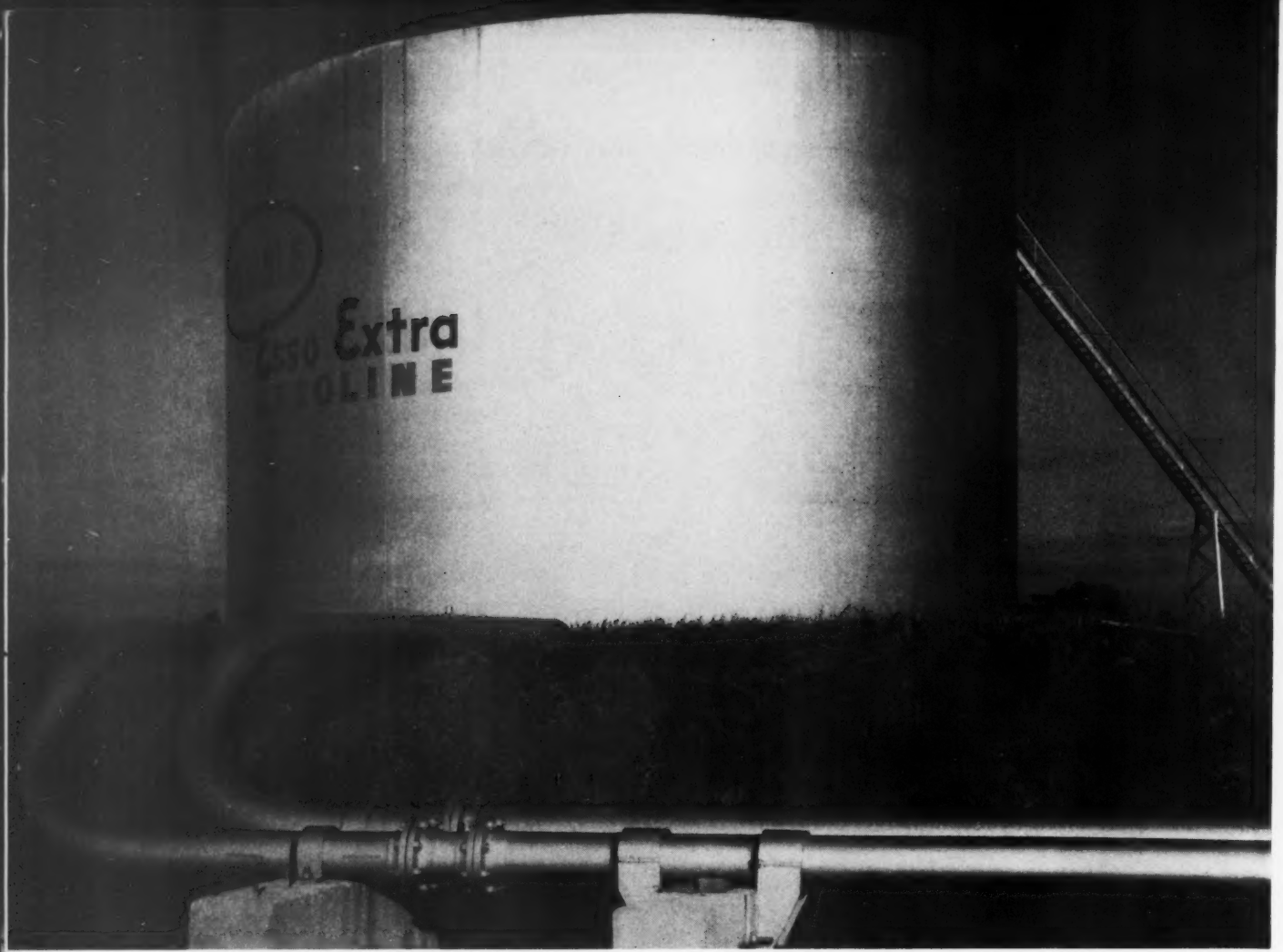


Final coating of aluminum RUST-BAN 296 is sprayed on by man suspended in bosun's chair hanging from movable A-frame buggy. Tanks in background, ready for aluminum, have been cleaned, red leaded, primed with RUST-BAN 263.



Completed paint job not only makes tanks attractive and last longer, but also provides display space for Humble product advertisements on tanks located near highways, such as this one on the products pipe line from Baytown to Irving.

because the aluminum finish coat reflects heat during summer weather.

Tank painting, a well-organized procedure, begins when the old paint scales and rust are scraped and buffed off with a pneumatic buffer in "falls." A fall is a section about 20 feet wide from the top of the tank to the bottom. The men stand on a platform supported by ropes which are fastened to the walkway near the top of the tank. The platform is lowered gradually until the fall is finished. Then over the cleaned surface a coat of red lead RUST-BAN 281 or Quick-Drying Red Lead Primer 272 is brushed on. This routine is repeated until the entire hull has been cleaned and red leaded. By this process, old paint scales and rust are kept out of the new paint; fewer men need to work on a tank at one time; and red lead is applied before corrosion has a chance to set in on the cleaned surface.

Then a coat of red primer RUST-BAN 263 and a coat of aluminum RUST-BAN 296 are sprayed on, but in these operations the falls are over a much wider area than during the cleaning and red leading. Spray painting is done from a bosun's chair which hangs from a movable A-frame buggy attached to the center of the tank roof. Two men push the buggy along the edge of the roof and steady it while the painter does the spraying.

In addition to red lead, red primer, and aluminum coatings, the deck of a floating roof tank gets a sprayed coat of black RUST-BAN 330—a new asphalt-petrolatum type non-hard drying material which stays pliable. All superstructure is sprayed with aluminum RUST-BAN 296.

The paint job is finished when a coat of black RUST-BAN 250 is brushed on the bottom ring of the tank and on the hand rails of the stairs. Tank register numbers are hand painted in the same coating.

Tank painting methods, like most phases of the oil industry, have been improved through the years. Once the whole job was done by hand, but in 1925, Humble began to use pneumatic buffers and power sprayers. It was found that the work could be done better, more easily, and one-third faster.

But Humble's real contribution to the fight against corrosion has been the development during the past 20 years of the most extensive and useful line of protective coatings in existence —RUST-BAN. *(The Rust-Ban Story* in THE HUMBLE WAY, January-February, 1949.)

Obviously, then, the time it takes to paint a tank is not *all* spent at the tank itself. Years of research and painstaking experimental work have gone into the making of those coatings before they ever touch a tank.

Witness Trees and Crossing Calls

IN THE language of the surveyor, a "witness tree" is a tree that stands at a *corner* of a surveyed tract of land. Slashes and symbols cut into the tree bear witness to the corner's existence, just as a human witness gives evidence under oath in a court of law.

"Crossing calls" is another surveying term that means what it says. Whenever a surveyor crossed ("called at") a stream or other natural obstacle, he made a note of the distance along his line from the corner to the stream. If two streams crossed his survey line, the distance to the second stream was entered in his field notes as another crossing call.

Crossing calls have made it easier for oil company engineers, surveying a lease before drilling is begun, to locate original corners. Witness trees may have been destroyed by man, uprooted by storms, blasted by lightning, or burned by forest fires. Earthen mounds raised to mark corners may have been eroded by wind and water. But most crossing calls still remain. Without them, footsteps of the first surveyor would be dim indeed—or erased completely.

Measured by present standards, instruments and equipment of the early American surveyor were as simple as the buckskin and homespun clothes he wore. He had a magnetic compass, a "Jacob staff" (a pointed staff to stick in the ground and hold the compass steady), and usually a brass Gunter chain. The chain was 66 feet long, so a distance of 80 chains was one mile. Age made the Gunter chain unreliable. As the soft brass links became worn, they grew longer; an old chain might be several inches longer than a new one. Laid down 80 times, an old chain would measure considerably *more* than a mile. No wonder today's surveyor has trouble following his predecessor's footsteps, as the law requires!

The magnetic compass was used to determine the bearings of the surveyor's lines. Since the compass needle pointed to *magnetic* North, rather than *true* North, each man tried to adjust by guesswork for the "angle of declination" between the two Norths. Some of the guesses were bad.

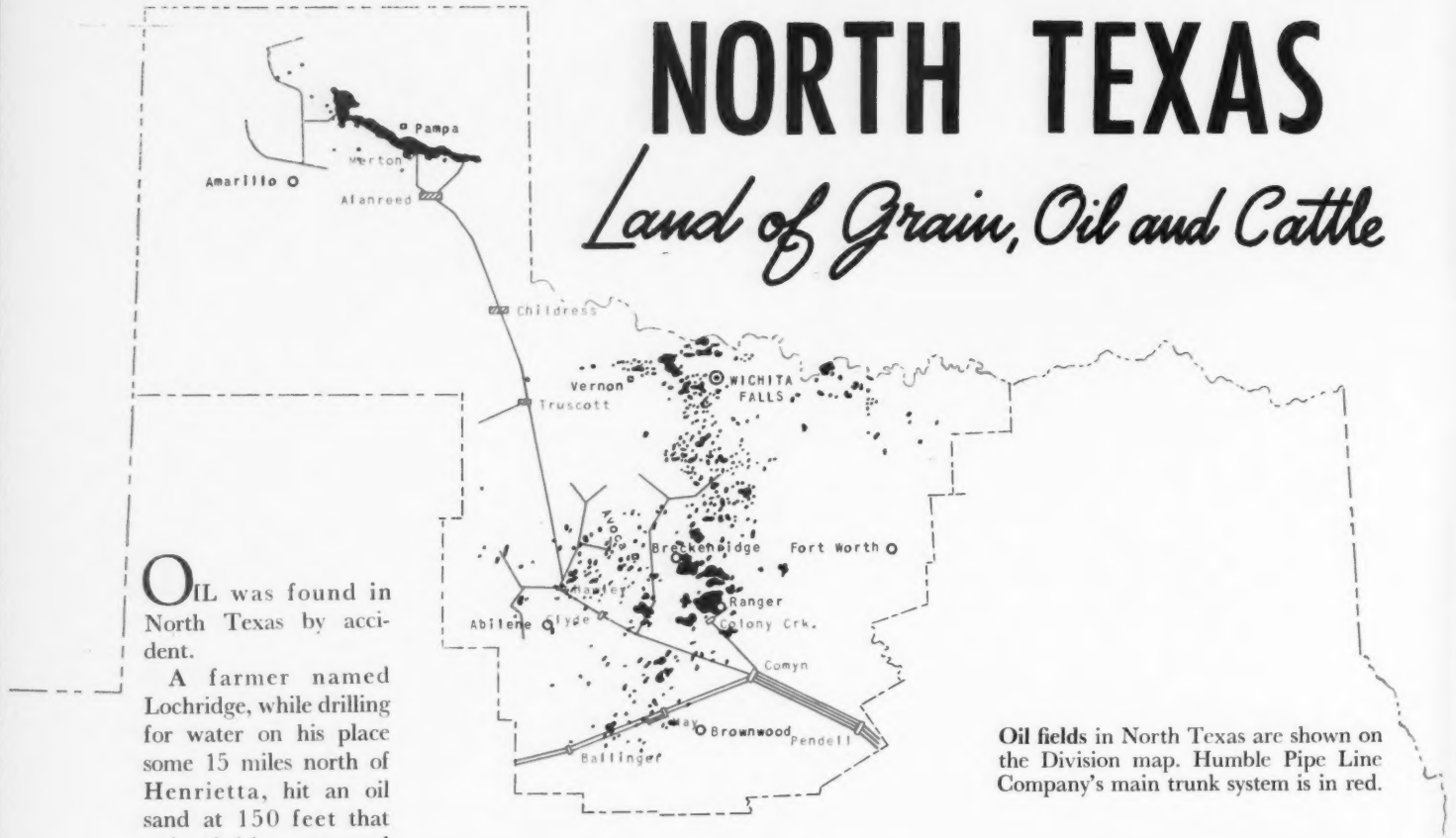
Instruments and equipment of a century ago were not all that made a field party's life hard and the results of its work uncertain. The surveyor and his chainmen were always at the mercy of unpredictable weather and still more unpredictable Indians. One old-timer is reported to have said that he and his party never cut a clearing, or "sendero," through thick brush because it would have brought Indians whooping down upon them in short order.

Another of the countless stories about surveying concerns a one-time officer in the Union Army who came to the Southwest to work. An artistic fellow with a predilection for the bottle, he would spend hours carving the finest scroll letters on witness trees. Instead of an axe, he used a small chisel. Asked why, he replied that the slower—and more artistic—method not only gave him a chance to express his aesthetic senses; it also gave him time for longer pulls at his bottle. Perhaps that is why some of his field notes have proved unreliable to this day. Occasionally, in his condition, it is understandable that an R should have been mistaken for a K!

This does not by any means cast a slur against the profession. For the most part, early surveyors were accurate, sober fellows who did a remarkably good job with the tools at hand. Though none of them earned a fortune, some of them earned fame and used surveying as a stepping stone to better things. A few even enshrined themselves in history and in the hearts of their countrymen. We know one such, at least. His name was George Washington.

NORTH TEXAS

Land of Grain, Oil and Cattle



Oil fields in North Texas are shown on the Division map. Humble Pipe Line Company's main trunk system is in red.

OIL was found in North Texas by accident.

A farmer named Lochridge, while drilling for water on his place some 15 miles north of Henrietta, hit an oil sand at 150 feet that ruined his proposed water well. This accidental discovery in 1902 brought to the area a swarm of interested oil men—men in whose imaginations the Spindletop gushers of the year before had kindled an exploratory urge.

During the next five years a large number of wells were drilled to the shallow producing sands between 150 and 300 feet, and the town of Petrolia sprang up on the north end of the field. Within 10 years of its discovery the field had produced more than two million barrels of oil. During that time also, gas was found at greater depth—gas in such quantity that the cities of Dallas and Fort Worth and some 20 other communities in North Texas could be supplied.

Today, on the rolling grassy hillsides south of Petrolia a few wells are still being pumped. The former sites of many others are discernible only as small dark spots in the grass where sleek whiteface cattle graze.

Although this first oil field did not immediately catapult North Texas into the oil limelight, it was the beginning of a gradually expanding search for oil which has led eventually into almost every county of the 77 embraced in the area known as Humble's North Texas Division. The Division includes the entire 32-county Upper Plains or Panhandle and a 45-county segment of the state generally known as the North Central Plains.

Following Petrolia, the next significant oil discovery in North Texas was also accidental.

In 1904, W. T. Waggoner, owner of a 600,000-acre ranch in Wichita and Wilbarger counties, sought water for his cattle. He ordered drillers to go deep in search of artesian water. Instead of water they found oil, but because it was in small quantities it caused little interest. Neighbors drew oil from the well in buckets to grease wagon axles, but no real exploratory work was done on the ranch until 1911. Excitement began to run high only when the Waggoner No. 5 was brought in as a 50-barrel a day producer in that year.

The community which sprang up on the site of a cattle shipping station was named Electra in honor of rancher Waggoner's daughter, and within a short time it had become a booming oil town. Wells were drilled hurriedly; oil was found in substantial quantity. By 1913 the field was producing at a rate of more than eight million barrels a year, and Electra boasted of a refinery, two topping plants, five gasoline plants, and a number of oil field equipment and supply houses.

From here the search for oil spread over a wide area in north and west-central Texas. Moran in 1914 and Strawn in 1915 were discoveries which brought interest southward. But it was the McClesky No. 1, near Ranger, roaring in as a 1,700-barrel a day discovery on October 21, 1917, which set off one of the great booms of early Texas oil history.

The total population of agricultural Eastland County in 1910 was 23,421. Within 18 months after the discovery of oil the quiet little town of Ranger had become a seething mass of 25,000-30,000 people. Lease dealings were in astonishing figures; big wells were

completed in rapid succession. Because of the great World War I demand for oil, the price was high and the race to produce it bordered on frenzy.

But if Ranger's entry into the oil picture was sensational, its exit was almost equally so. This region of rolling hills covered with scrub mesquite, elm, and oak was "forrested" with derricks. From more than 600 wells a peak production of 73,000 barrels daily flowed to refineries through a maze of hurriedly laid pipe lines. This was in 1919. Soon thereafter the field's reservoir energy decreased and production fell rapidly.

Almost simultaneously interest swung northward again. Electra had stimulated considerable exploratory drilling in Wichita, Archer, and other North Texas counties. Several minor strikes had been made, but when on July 29, 1918, "Fowler's Folly," near Burkburnett, tapped a sand that produced 2,200 barrels a day, it touched off what developed into a turbulent townsite drilling program. Wells could be drilled quickly and rather economically to the producing sand at about 1,700 feet, so by late 1919 the new field was producing at the rate of 120,000 barrels a day.

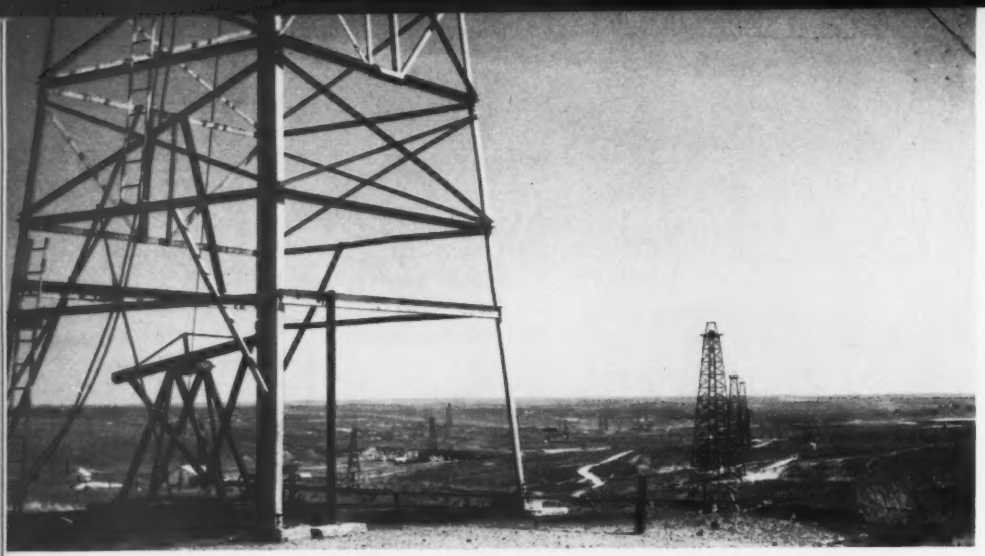
Black spots in the grassy pastures south of Petrolia are today's only reminders of wells in North Texas' first oil field.

Although Burkburnett drew tremendous interest, destiny decreed that it share honors with the Desdemona and Breckenridge fields to the south. Desdemona reached peak production of 22,000 barrels a day in 1919; Breckenridge, just beginning to develop at that time, reached its high of 115,000 barrels a day two years later.

In this somewhat feverish development in North and West-Central Texas, the newly organized Humble Oil & Refining Company made its bid for a place. The several interests which combined to form the Company in 1917 had small holdings in these areas, along with other properties in the Gulf Coast and other sectors. The Schulz Oil Company, owned by R. L. Blaffer, W. S. Farish, Clint Wood, and Bert Broday, was producing 150 barrels of oil daily on the Schulz-Serrien lease in Wichita County when it was pooled with other properties. Also included was a four-inch pipe line from the lease to the railroad loading rack at Iowa Park nine miles away.

From these modest beginnings the Humble organization has grown apace with the development of that area and

Massed combines cut a wide swath through a field of golden grain in the Upper Panhandle winter wheat region.



Derricks are spaced on the rolling hillsides and in raw gullies southeast of Pampa. Northwestward the terrain becomes rougher and the great Panhandle field widens.

other areas in the state. The young Company added substantially to its producing properties in the West-Central and North Texas areas, and in 1919 Humble Pipe Line Company was organized. Construction was immediately begun on a pumping station at Comyn and on an eight-inch line from there to a point on the Houston Ship Channel where Baytown refinery was under construction.

While the somewhat sensational discoveries at Electra, Ranger, Burkburnett, and Breckenridge held immediate attention, oil exploration began to spread far and wide over the entire North Texas and Panhandle region.

Geologically the region is exceptionally interesting. Back 250 million years ago, as geologists reckon, the West Central Plains and much of the Panhandle were covered by a shallow continental sea. Arching across the Panhandle, north of where Amarillo is today, and following approximately along the Texas-Oklahoma border was the Amarillo-Wichita-Muenster mountain chain. During succeeding ages these mountains were worn down slightly and were quickly covered under thousands of feet of sedimentary beds. They still exist today, buried beneath the surface in the Panhandle and in Montague, Cooke, and Grayson counties.

As early as 1905, Charles N. Gould, University of Oklahoma geologist, had studied and mapped rock outcrops and domes in a large area north and south of the Canadian river in the Texas Panhandle. Though geologically interesting, his findings were not to be acted upon until more than a decade later. It was on December 13, 1918, that the Amarillo Oil Company completed the No. 1 Masterson gas well for a 10 million cubic feet producer on a site selected by geologist Gould. Other wells followed, with Masterson No. 4 coming in for 107 million cubic feet a day.

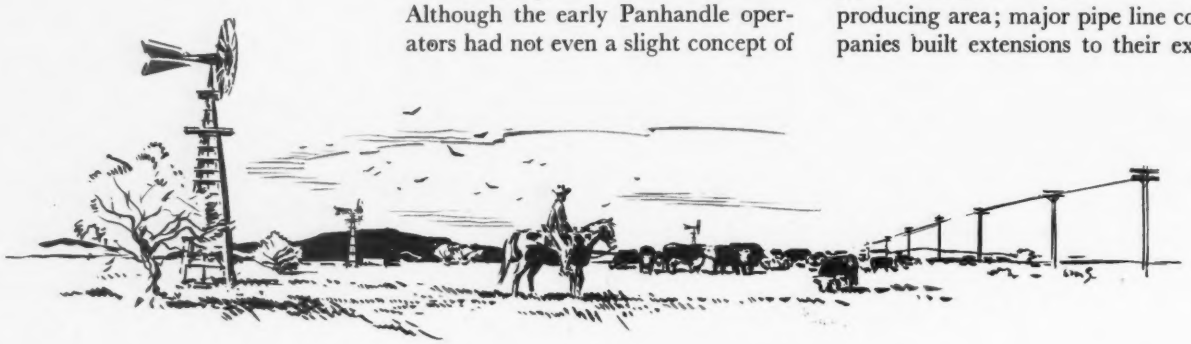
Naturally, the Panhandle area was electrified. Leasing became widespread in Moore, Potter, Hutchinson, Carson, Gray, and Wheeler counties. Although the early Panhandle operators had not even a slight concept of the producing area's eventual extent, there were many who were eager to invest money in the region's possibilities.

In November of 1920 the first oil well was brought in—the 175-barrel a day Burnett No. 2 on the 6666 Ranch located in Carson and Hutchison counties. Gas development went on apace, but oil development lagged. It was not until 1925 that the Panhandle area blossomed forth as a great potential oil region. Oil discoveries were reported in Wheeler, Gray, and Potter counties and the producing area in Carson and Hutchison counties was expanded.

The Panhandle area came of age in oil production in 1926. Big wells were completed in a number of existing fields, and excitement became intense when early in the year the No. 1 Smith came in for 10,000 barrels a day, opening the large and prolific Borger field. From there the play spread southeastward across the jagged red hills, and by 1927 the area was producing more than 150,000 barrels a day. Continued expansion eventually developed oil and gas production in an almost continuous area 115 miles long and from 20 to 40 miles wide.

Today, more than 1,700,000 acres —some 250,000 acres of which is oil area—are included in the vast Panhandle oil-gas producing region, and each year more area is being added. Most recent major gas area added is the Texas-Hugoton extension of Sherman and Hansford counties which connects the Panhandle to the very prolific Hugoton gas field of Kansas and Oklahoma.

Rapid development called for a tremendous expansion of transportation facilities. Railroads raced out from Amarillo to reach the vast oil producing area; major pipe line companies built extensions to their exist-



ing lines; long range gas lines were laid to pipe the great gas flow to mid-western metropolitan markets.

Quite naturally, natural gasoline plants and carbon black plants sprang up in the area. The first gasoline plant built in 1926 now has 36 sister plants, with a capacity of about 2,740 million cubic feet of gas daily.

The first carbon black plant was built in the Panhandle in 1927. Today, smoke-smudge from some 30 plants hangs like storm clouds on the horizon. Production of this product so essential to the manufacture of automobile tires, printer's ink, phonograph records, and various paints and lacquers, amounts to more than one-half billion pounds a year.

Add to these two phases of industrial enterprise five refineries and synthetic rubber and other associated plants in the Panhandle and it begins to develop a true picture of the very substantial industrial development which has followed the discovery and widespread development of oil and gas resources in the area.

The same, of course, is true of the North Central Plains area. Gasoline plants number 35, although most of them are smaller, but refineries number 15.

The overall picture, then, of north Texas is one of an enormous area once entirely devoted to farming and cattle growing, today transformed into a partially industrialized sector, where farming and ranching continue on an improved basis and where busy cities and towns have replaced hamlets and villages.

Many of the state's great early cattle domains were established in the North Texas and Panhandle sectors, and some of the famous cattle trails of the early days traversed the area. While a number of large "spreads" are still operated in North Texas and the Panhandle, many thousands of acres of former ranchlands, particularly in the Panhandle, have been converted to farming.

Cotton and grain fields now stretch for many miles where only cattle roamed 75 years ago—even 30 to 40 years ago. Large-scale mechanized farming has brought the Panhandle area into full bloom as a cotton, wheat, and sorghum growing area.

Of the state's annual wheat production, which in recent years has averaged about 60 million bushels, 65 to 75 per cent is grown in the hard winter wheat belt of the High Plains. A minor hard wheat belt also extends from east to west across a chain of counties just south of the Red River.

Cotton growing, although not as significant a farming effort in the region as in some other sectors of Texas, gained impetus 20 years ago with the opening to that crop of many thousands of acres of former ranch lands in the South Plains. In recent years, however, acreage in most counties has declined and a greater emphasis has been placed on grain sorghums. Lamb County, with an annual production in excess of five million bushels, is the state's leading sorghum producer, and other counties in the area have swung considerable acreage to this profitable grain crop.

Along with cotton and grain, cattle continue to hold a major interest for landowners in the area. A large percentage of the counties are among the state's high cattle population counties, so that the income of the area comes primarily from oil and gas, and from grains, cotton, and cattle.

One of the remarkable features of the area since the discovery of petroleum resources has been the rapid strides made by many of the cities and towns, particularly those which serve as grain and oil hubs.

The total population of Potter County in 1920, before the discovery of oil in the Panhandle was 16,000; today the city of Amarillo alone claims some 75,000 inhabitants and is a real oil and grain center. Before the discovery of oil in major proportions in Wichita County, that county's total population in 1910 was 16,000; today the city of Wichita Falls, another oil refining and equipment center, ranks in the 75,000 class. Tarrant County's population was only

Grain trucks line up for miles at the Perryton area, awaiting turn to unload at elevators in upper part of picture.

about 152,000 in 1920; today Fort Worth, a cattle, grain, and oil center is over the 200,000 class. And so goes the history of the area, although some of the early oil towns which suddenly blossomed to boom proportions have settled down to a more normal and steady development.

During the past 30 years the Humble Companies have played a role in the growth and development of the petroleum industry in the area. From modest beginnings in Wichita County, Humble has extended its operations into a great many counties, and now has 306 active wells producing a daily total of about 5,800 barrels. Drilling and producing operations are spread over a wide area, ranging from Cooke County on the east to Lamb County on the west, and from Coleman and Runnels counties on the southwest to Sherman and Hansford counties on the extreme north of the Panhandle. These widespread operations are handled out of the North Texas Division office in Wichita Falls and out of three district headquarters at Avoca, Vernon and Pampa. A total of 143 employees are engaged in drilling and producing operations, and the Company has substantial acreage under lease for future development.

Humble Pipe Line Company came into the area immediately upon organization, building its first pump station at Comyn and first line from there to the Coast in 1919. Since then lines have been extended far up into the Panhandle, and westward to serve producing fields in the adjoining West Texas Division. There are approximately 583 miles of main trunk lines in the division, beginning at Borger in the Upper Panhandle, with a capacity to move 59,000 barrels of crude oil daily to refineries and to tidewater. Division headquarters for the Pipe Line Company are at Cisco, and district headquarters are at Cisco and Pampa. The number of employees engaged in transporting crude oil in the North Texas Division is 358.

Lease pumper L. C. Good opens a valve to watch a thin stream of oil flow from "Old Number 13" on Humble's Schulz-Serrien lease near Burkburnett. For more than 30 years Good has pumped this well, depicted in the watercolor painting on the next page, and other wells on the lease.

Before becoming a pumper in January, 1919, Good had been employed by the Schulz Oil Company, one of the properties which was pooled to form Humble Oil & Refining Company in 1917. He was a member of the crew which drilled wells No. 26 and 28 on the lease before becoming a lease pumper.

For most of these years he has lived on the lease and has raised his family of one daughter and two sons. One son is a Humble employee in the Vernon district and the other works for another oil company near Wichita Falls.

In all of his years on the lease Mr. Good has never lost time from work because of an accident.

Since the close of the war Humble's Sales operations have also been expanded to include some of the North Texas area, with bulk and retail outlets at Wichita Falls, Denton, Gainesville, Windhorst, Anson, Baird, Seymour, and Weatherford. Until war's end little marketing had been undertaken north of U. S. Highway 80, but since then a substantial number of outlets have started marketing quality Humble products.

Although North Texas, where many of the state's great oil discoveries were made 20 or more years ago, is today not producing as much oil as it once did, its contribution to the state's petroleum economy is material. Average annual oil production approximates 85 million barrels, and gas production averages about one trillion and 16 billion cubic feet yearly.

So tremendously has the industry grown since the first accidental discovery near Petrolia in 1902, that it is natural to say that agricultural, civic, industrial, and social advancement in the area have been bound up inseparably with the oil and gas industries. North Texas, like all other sectors of the state, has been geared to oil and gas development, and the future of the area hinges in an important way on the continued production from existing fields and the future development of still unfound reservoirs of gas and oil.

The Cover Painting

Artist Jerry Bywaters found an intriguing sight in the "power" in the wheat field reproduced on the cover. In the Panhandle area, there are quite a number of these central power units which drive the pumps of a number of oil wells simultaneously. A single engine turns the eccentric wheel from which push rods radiate to the well pumps.

Schulz-Serrien Lease — *Jerry Bywaters*

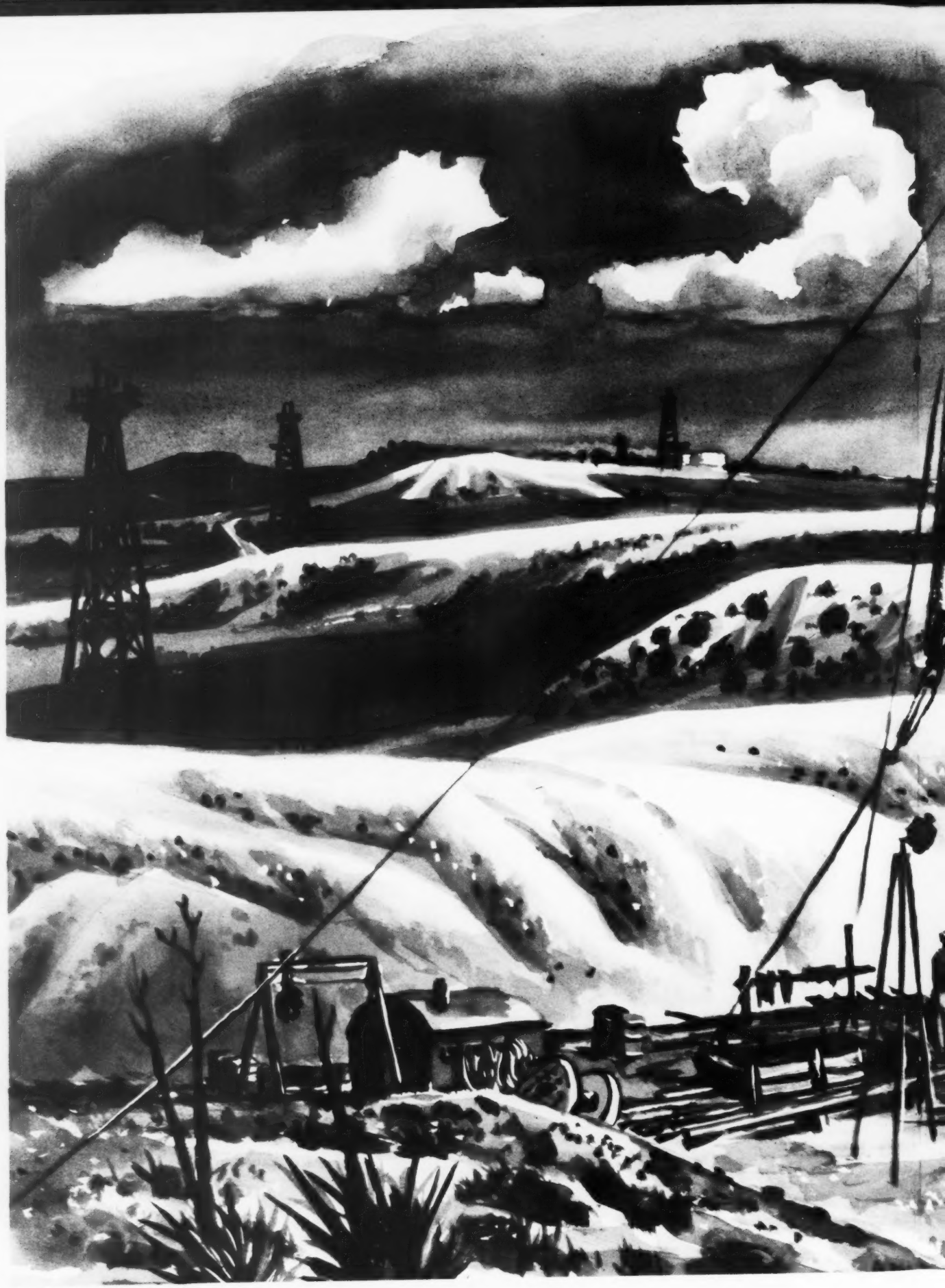
An Artist Portrays North Texas Oil

Forty-four year old Jerry Bywaters, director of the Dallas Museum of Fine Arts, is a great nephew of B. A. Bywaters, on whose land the Producers Oil Company in 1910 found the first show of oil that led to the later development of the Electra field.

Artist Bywaters speaks lightly of his 1/164 inherited interest in two small producing wells in the field today, but he does report that he enjoyed very much his two automobile trips through the North Texas-Panhandle area gathering material for the series of bright watercolors in this issue.

Artist Bywaters in working clothes and sun glasses on the Bateman lease, King County, in central West Texas.

In addition to being director of the Dallas Museum, Bywaters is also associate professor of art at Southern Methodist University. He is a graduate of the Dallas school, and studied art in Europe and Mexico. His works hang in museums and in University and private collections in the Southwest; he has exhibited in some of the nation's leading galleries and has been awarded purchase prizes in a number of Southwestern shows.



Spudder in the Panhandle

Jerry Bywaters

Jackknife on Bateman Ranch — *Jerry Bywaters*

J. W. Workman, left, plant superintendent, meets visitor S. K. McLelland for a tour of Anahuac Gas Plant.

VISIT TO A GAS PLANT

S. K. McLelland, from Houston Office, Sees Anahuac Plant

"I'VE been with the Humble Company for 29 years, but this is my first time inside a gas plant."

These were the words of S. K. McLelland as he entered Humble's Anahuac Gas Plant for a tour of the plant as guest of THE HUMBLE WAY.

McLelland, a member of the Employee Relations department who administers the Company's hospitalization plan, won the trip when his name was drawn from a hat.

Like many other Texans, McLelland had seen gas plants before, for they are rapidly becoming familiar sights in all sections of the state where oil and gas are produced. But like most people, he had never been inside one before.

McLelland was met at the Anahuac Gas Plant by Superintendent J. W. Workman, and the two men were soon engrossed in conversation about the plant and its functions. McLelland learned that the plant is part of a rapidly-expanding program in the oil industry—a program for conserving and making greater use of natural gas. Plants like Anahuac, he was told, extract an increasing number of useful products from gas—casinghead gas from oil wells and gas from gas wells —and play an important part in the industry's conservation program.

Workman explained that gas plants extract heavy, or "wet," hydrocarbon molecules from gas to make natural gasoline and liquefied gases such as propane and butane, leaving the residue, or "dry," gas to be utilized for a multitude of uses in homes and industries.

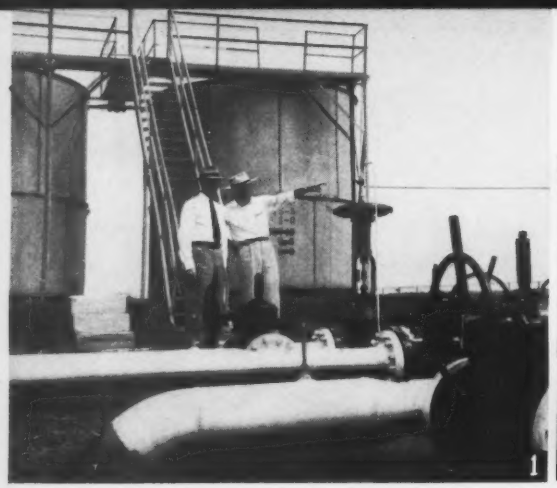
"Then gas plants are making good use of a tremendous amount of gas that used to be flared," McLelland commented.

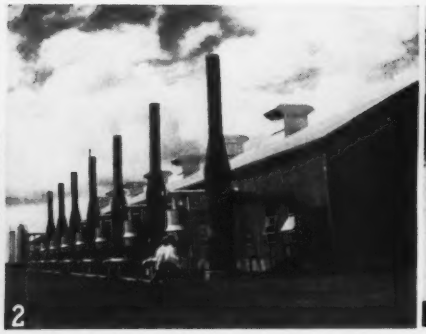
"That's right," Workman agreed. The Anahuac Gas Plant was completed in 1947, he continued, and is now processing about 60 million cubic feet of gas a day, from which about 900 barrels of liquid products are extracted.

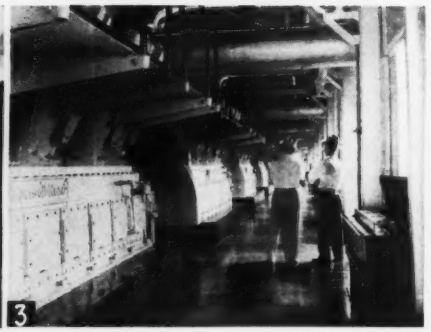
"What I want to know," McLelland said, "is how you get liquid products from gas."

"Nearly everybody asks that question," Workman smiled. "Let's go through the plant and I'll tell you about it as we go."

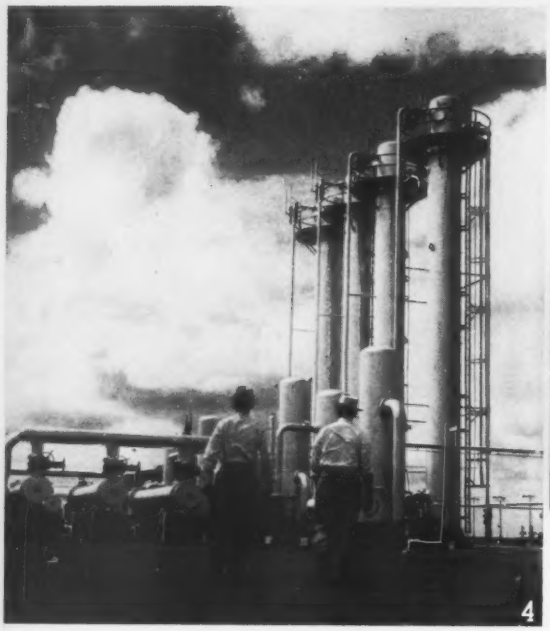
As the two men entered the plant McLelland was told that four operating employees are needed on each

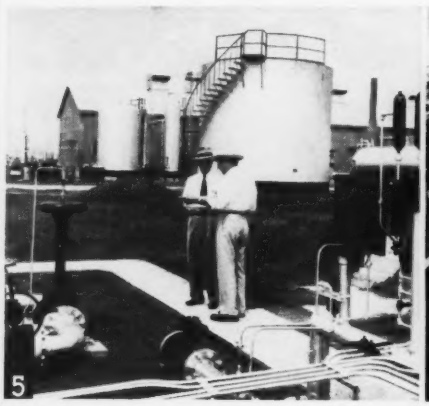


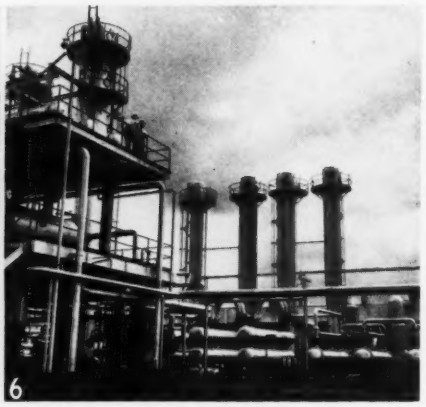




McLelland and Workman began their tour at the plant's incoming gas manifold (1), from where they followed the gas lines to the compressor building (2). There they inspected seven compressors which raise the pressure of gas to 810 pounds (3).







The superintendent and visitor next locked over the absorption towers (4), where a special oil absorbs "wet" fractions from the gas, and then stopped at the outgoing gas manifold (5). A high platform afforded a close view of the stills (6).

eight-hour shift. However, Workman explained that the maintenance and office staffs bring the total number of employees to about 35, most of whom live with their families in a nearby employee housing community.

Walking through the plant, the two inspected the boiler house, fire fighting system, engines and pumps for circulating absorption oil, cooling towers, and the water treating unit. Leading McLelland on to the edge of the plant property, Workman stopped and pointed out several large pipes and valves.

"These are the lines which bring gas into the plant," he said. "Part of the gas comes from nearby gas fields, and part of it is casinghead gas produced with oil in the Anahuac oil field."

"Could we follow these gas lines through the plant and see what happens to the gas?" McLelland asked.

"Sure," Workman replied, and took his guest on to a building containing a battery of seven 1,000-horsepower compressors which compress the gas to about 810 pounds per square inch. McLelland was not only impressed with the equipment, but commented that it was "as clean as a kitchen."

From the compressor building the two men followed the gas lines to four towers which Workman identified as absorption towers.

"These are the answer to your question about how liquid is extracted from gas," Workman said. He explained that a light oil, called absorption oil, is pumped to the top of the towers, and the "wet" inlet gas, at the proper temperature and pressure, is bubbled up through the oil. The oil absorbs the heavy, "wet" fractions from the gas and is drawn off at the bottom of the tower, while the "dry" gas passes off at the top for further processing and final delivery to a gas transmission line.

"And the transmission line delivers the dry gas to market," McLelland said.

"Correct," Workman replied. "However, a small amount is used for engine fuel and heating purposes at the plant and in the Anahuac oil field."

Across from the absorption towers McLelland inspected other equipment, including two towers called stills. Here, his host explained, the liquid which came from the gas is removed from the absorption oil by a process of vaporization and stripping with steam. This liquid is then stored in tanks until being sent to Baytown Refinery by pipe line.

"What happens when it reaches the

McLelland and Workman view the plant from a firewall around storage tanks, left, where the liquid products from the gas are stored until sent to Baytown Refinery. There the propane, butane, and natural gasoline go into making many products.

refinery?" McLelland asked.

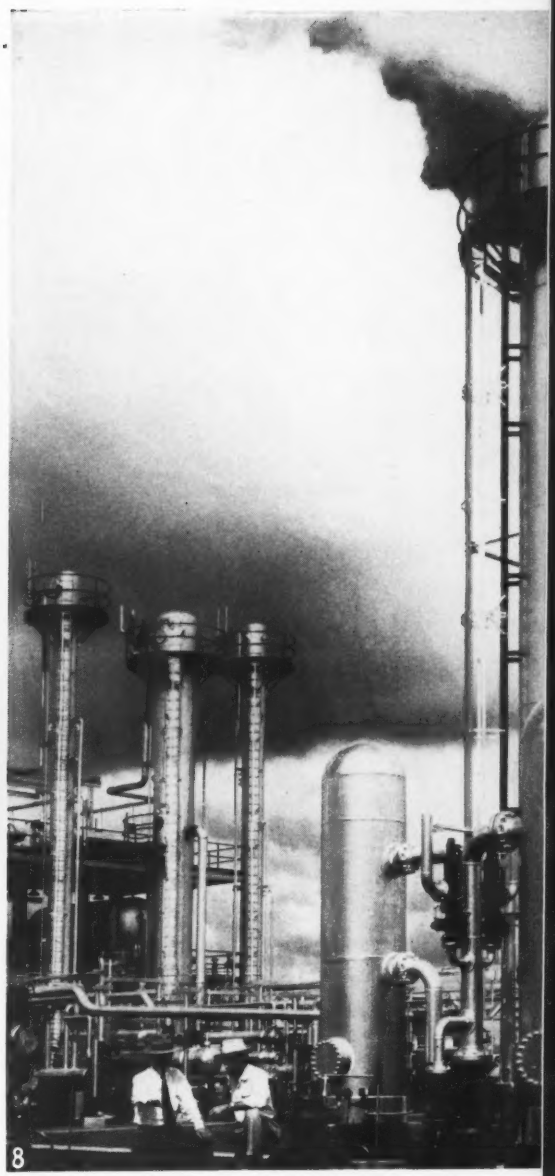
"There it is further refined into propane, butane, and natural gasoline," Workman explained. "Sometimes these products are blended with others to make high-octane gasoline, and of course you know that propane and butane are used for heating and cooking in rural homes and for other purposes."

"But," he continued, "I understand these products might also be used as raw material for making synthetic rubber, or they might go to one of the many new petrochemical plants on the Gulf coast. There they might finally go into making all kinds of plastics, such as raincoats and telephone cases; or synthetic cloth, paint and varnish, photo film, detergents, anti-freezes, solvents, rubbing alcohol, synthetic tile, refrigerants, flavorings, cellophane, artificial leather, and many other products."

"Why, I must have many things in my own home which came from gas," McLelland said. "I can see how these plants not only conserve gas, but form the basis for other industries too."

"That is true," agreed Workman, "and remember, this plant is only one of many in operation today. For example, our Company is operating 13 natural gasoline plants at present, and has a part interest in six others. And the Company is still expanding its gas conservation facilities."

McLelland considered and made this parting observation: "Of course I have known for a long time how important oil is to our lives, but now I see that gas is becoming more important every day. It looks like natural gas is really coming into its own."



Standing beside the plant's tall towers, McLelland learned how each functions.

Ray H. Horton held hat for drawing while Secretary Margarete Jeppesen drew McLelland's name as trip winner.

PRESSURE PAYS OFF

At Lovell Lake, maintaining pressure increases oil recovery, conserves gas

IN THE Lovell Lake field, ten miles southwest of historic Spindletop and 14 miles south of the city of Beaumont, high pressure gas is being injected into two oil reservoirs to increase their yield of oil.

The contrast in the two oil fields emphasizes the progress in the production of oil since the turn of the century: old Spindletop with its few remaining dilapidated wooden derricks, Lovell Lake with its unobtrusive Christmas trees and neat tanks on the prairies and along the bayous.

The contrast goes much deeper than outward appearances, however, for in Lovell Lake wells, pressures more than seven times as great as that which blew in the world's most famous gusher are efficiently controlled. Present-day production practices, including all of the reservoir and drilling knowledge developed in the nearly 50 years since Spindletop gushed in, make it possible to scientifically control oil and gas production and, as at Lovell Lake, supplement nature's forces to achieve greater recovery of oil.

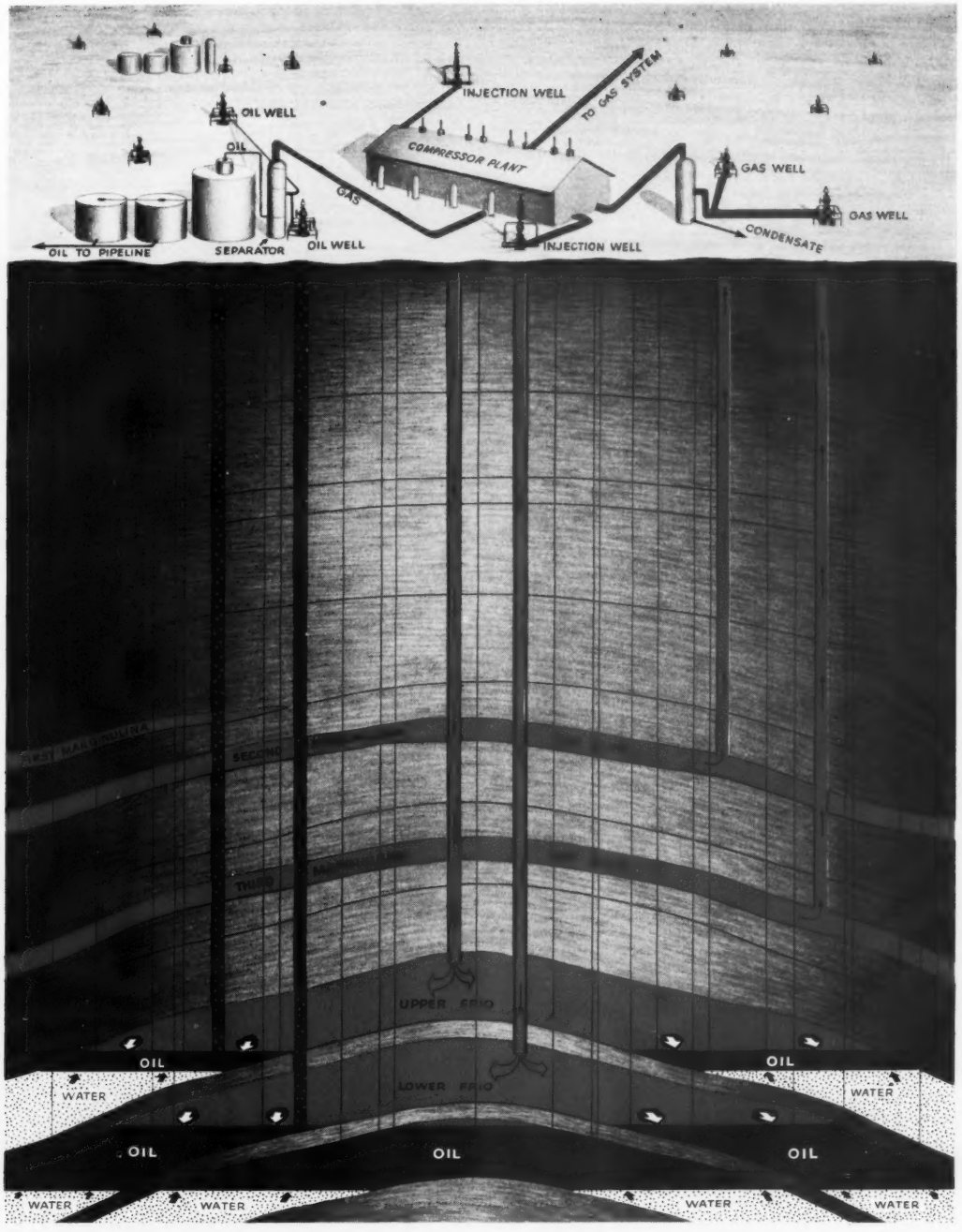
By maintaining the pressure of the oil reservoirs at Lovell Lake, engineers estimate that ultimately nearly three million additional barrels of oil will be recovered. Since 1941, produced gas has been injected into the Upper and Lower Frio sands to maintain the pressure of the reservoirs and prevent shrinkage of the gas caps overlying the oil. Later, after the reservoirs are depleted of oil, there will remain a substantial gas reserve. Thus, while augmenting oil production, gas is conserved for future use—quite a contrast indeed with Spindletop's heyday in the first few years of the century when wells were turned loose for the spectacle, and reservoir gas and energy were dissipated at a terrific rate.

Maintaining the reservoir pressure at Lovell Lake not only assures additional oil recovery, but also makes possible higher efficient production rates. That latter point is more important than it appears at first glance. The project, begun just 12 days after Pearl Harbor, made it possible to produce oil faster to help supply World War II demands without damage to the reservoir or loss of reservoir drive efficiency. Without pressure maintenance, oil production rates would have declined rapidly and much oil would have been lost in the reservoir through migration into the gas cap.

Information about the oil reservoirs of the Lovell Lake field was collected as the field was developed after the discovery well in the Upper Frio sand was completed in February, 1938. As more wells were drilled, production was found in the Lower Frio in July, 1939, and it was indicated that a

In the old Spindletop field, trickle of oil and salt water is pumped into an open ditch from well nearly 50 years old.

At Lovell Lake, extremely high gas pressures are controlled by complex pillars of valves like this one under a gin pole.

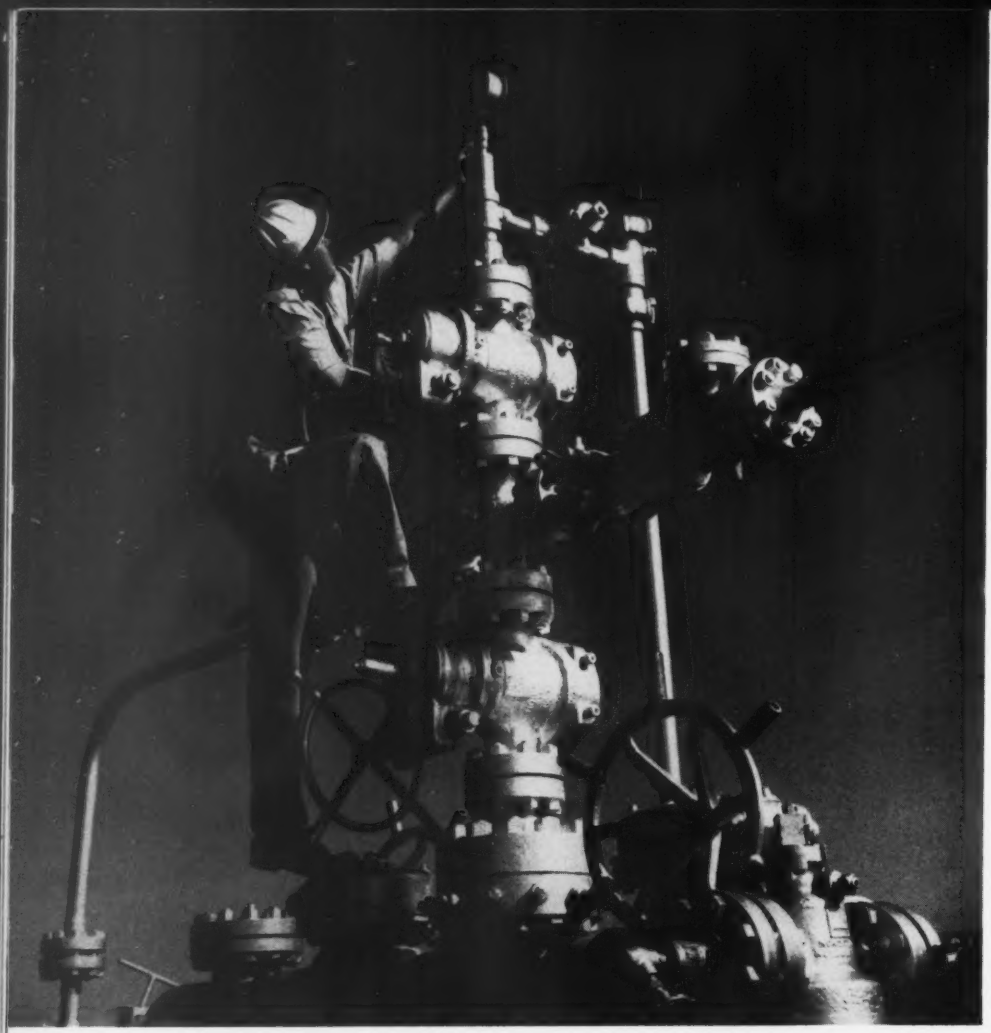


Gas from the second and third Marginulina gas sands is compressed to maintain the Upper and Lower Frio gas caps in Lovell Lake field. Casinghead gas from oil wells is used to supply the commercial gas system. Frio sands are between 7,600 and 8,000 feet, and the structure shown here is more than two miles across.

deeply-buried salt dome had arched the formations and had formed oil traps in the Frio sands between 7,600 and 7,800 feet. The two sands, separated by 40 feet of shale, were found to have relatively thin oil columns beneath large gas caps, giving the oil zones the shape of large elliptical rings.

The central portion of the Lower Frio has been found to be separate from the main sand, and is called the Lower Frio stringer sand. Its gas cap is insignificant. Water driving up from below appeared to be the primary producing mechanism for all three reservoirs.

Because of the thin oil section of the Upper Frio (only 10 feet), completing a well without producing excessive salt water (if producing from too low in the sand) or excessive gas (if too high) was extremely difficult, and practically impossible. Drillers and well completion experts attempted



Through Christmas tree of injection well, gas at 3,450 pounds per square inch pressure is pumped into the gas cap of the Upper Frio oil reservoir.

unsuccessfully to find the point where oil could be produced with only the 750-800 cubic feet of dissolved gas per barrel of oil.

Detailed studies were made as early as possible to determine the exact characteristics of the reservoirs and the most practical means of developing both sands. By the middle of 1940, engineers had determined that free gas (from the gas cap) produced with the oil was excessive, causing the gas cap to shrink under pressure of the water pushing up from below. As the Upper Frio gas cap shrunk, some oil migrated upward into the gas zone where perhaps 30 to 40 per cent could never be recovered.

High permeability along the bedding planes of both sands, indicating easy flow of oil, coupled with the absence of faulting in the oil structure, provided an ideal condition for gas return to prevent oil movement into the gas zone. On the basis of the studies made, and with the cooperation of the three other operators in the field, it was decided that Humble would build and operate a pressure maintenance plant to inject produced gas into the Upper Frio gas cap to prevent shrinkage. The plans were worked out, with the operators participating in relation to their share of the field's production, and approval was granted by the Texas Railroad Commission. The compressor plant, with a daily capacity of 60 million cubic feet of gas, has been in operation since it was started up on December 19, 1941.

Gas produced with oil from both the Upper and Lower Frio sands was gathered and compressed to 3450 pounds per square inch for injection into the Upper Frio gas cap. Surveys indicated that returning gas to the gas cap retarded the reservoir pressure decline and shrinkage of the gas cap.

Shrinkage of the gas cap, if not prevented, involves the loss of a sizeable quantity of recoverable oil which moves up to saturate the gas sand. Approximately 15 per cent of the oil which migrates is lost in saturating the tiny pore spaces within the sand, and still more, totalling perhaps 40 per cent in all, may be lost if it is necessary to "chase" the oil upward by extensive well workover programs. Thus the practical way to produce oil from the Upper Frio reservoir is to prevent gas cap shrinkage and not only relieve the possibility of losing oil to saturate the gas sand, but also minimize the prospect of the costly and questionable workovers during future operations.

The Upper Frio gas cap was held within about one per cent of its size when injection began through 1944, while oil production averaged more than twice the pre-war level. During that time approximately 56.5 million cubic feet of gas was injected daily. A survey in the fall of 1944 indicated the need for additional gas injection to compensate for unavoidable losses, and one million cubic feet of gas daily was produced from a high-pressure Marginulina sand above the Frio for injection into the gas cap. At present about 99.3 per cent of the gas produced is returned to the reservoir. This is sufficient to maintain the size of the gas cap fairly constant.

Shrinkage of the gas cap of the Lower Frio main reservoir became evident from reservoir study conducted in 1945, and injection of 1.8 million cubic feet of gas daily to that sand was started in 1946. This was enough to return the gas cap to its original size, and injection was temporarily discontinued in 1948.

As the need for more gas for injection and commercial fuel has arisen, two high pressure Marginulina gas sands have been developed. Horsepower required for gas injection is less when the high-pressure gas (1450 psi) of the Marginulina sands is used for injection at 3450 psi and the lower-pressure gas from oil wells is used to supply the commercial gas needs.

In 1946 an abnormally high pressure gas sand was found at a depth of 9,030 feet. The discovery well, Jefferson Land Company 40, has a tubing shut-in pressure at the surface of

6,650 pounds per square inch, one of the highest gas pressures yet encountered. At present gas from this reservoir is used to supply part of the demand of the commercial gas system.

The compressor plant at Lovell Lake is equipped with five large gas-engine driven compressors and necessary auxiliaries. Unlike cycling and absorption plants, no liquid products —propane, butane, gasoline—are removed from the gas at Lovell Lake. The gas is "scrubbed" to remove small amounts of water and oil before being pumped to the injection wells. By maintaining the reservoir pressure, approximately 50 per cent more condensate is recovered from the gas produced from oil wells. The condensate is separated from the gas and is flowed into the crude oil tanks.

Gas in the Lovell Lake field reaches the plant through a network of four pipe lines. High-pressure gas from the Marginulina gas sands and those wells in the Upper Frio with sufficient pressure flow into the 1450 pounds per square inch line to the plant. This gas is compressed to 3450 psi and injected into the Upper Frio gas cap.

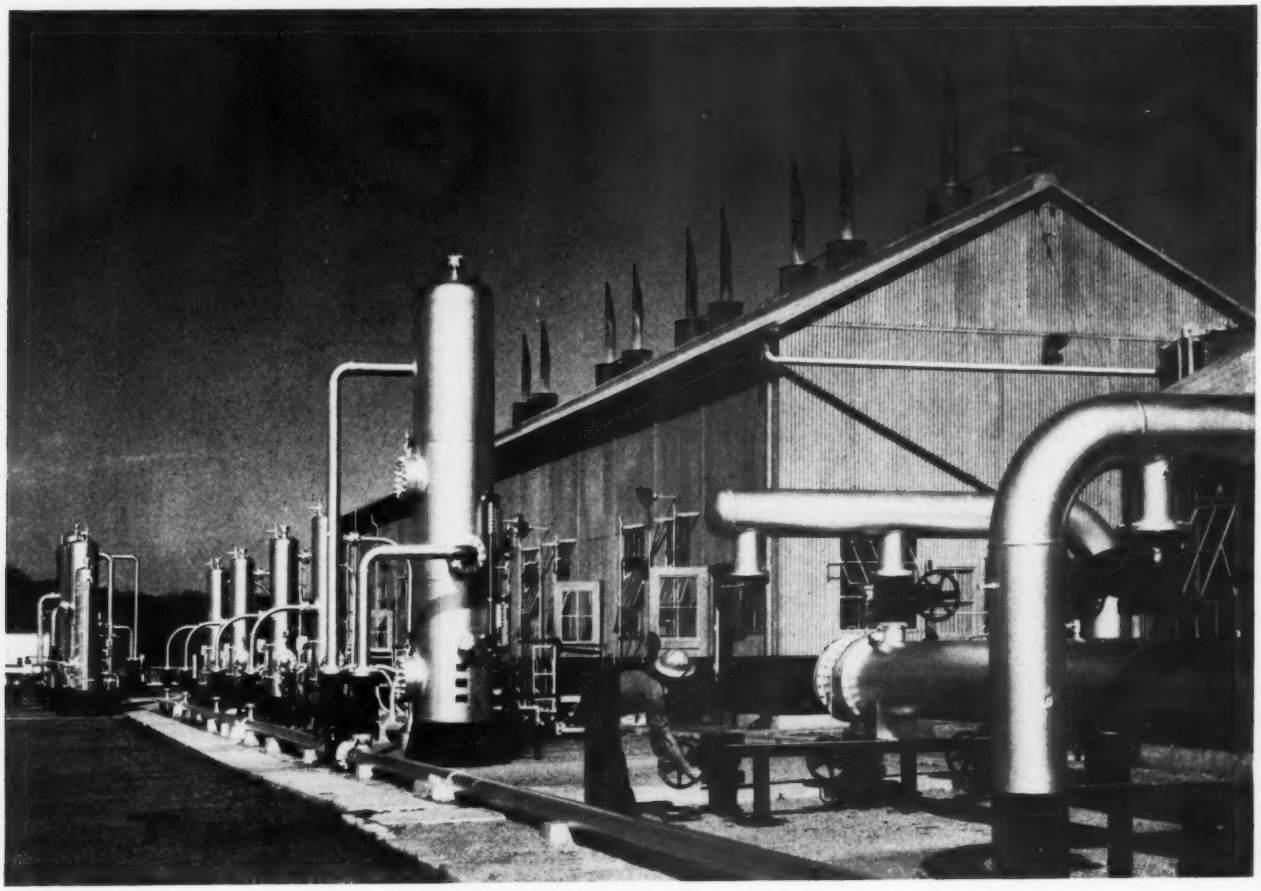
The intermediate system gathers gas from wells incapable of flowing into the high pressure lines, but with pressure too high to be handled economically in the low pressure system. The gas is gathered at 700 psi and sold to the commercial gas system without compression at 600 psi.

The low pressure line is operated at 80 pounds pressure and handles the gas which cannot be produced into the intermediate systems. Flash gas, or gas which comes out of solution when oil is dumped out of the high and intermediate system separators, is also gathered by the low pressure system. Gas of the low pressure system supplies fuel for the plant and the leases, and the remainder is compressed to 600 psi for sale to a commercial gas system.

The fourth gas system gathers gas for lease use only and operates at 20 to 25 psi. Thus all the gas produced in the field is used to maintain the gas cap, to provide fuel for plant and leases, and to supply a commercial gas system.

Pressure maintenance at Lovell Lake is a significant example of proper conservation of oil and gas. It is also an example of how oil operators can cooperate to better utilize and augment nature's forces. In the first seven years of the project, to January 1, 1949, an estimated 1.6 million barrels of oil and condensate had been saved through the application of proper oil and gas production practices. Better use of petroleum resources has been achieved through the conservation of gas for future needs, and the production of oil during the times of greatest need—during and since World War II—rather than the depletion and loss which might have been.

Gas enters Lovell Lake plant through manifold at bottom of picture, is "scrubbed" of oil and water and compressed for injection or sale to gas system.



IN *new* QUARTERS

Heavy equipment moves in as occupation of ultra-modern central shop building begins. This scene was duplicated many times before installations were completed.

Centralization of shops at Baytown Refinery begins as new building is completed

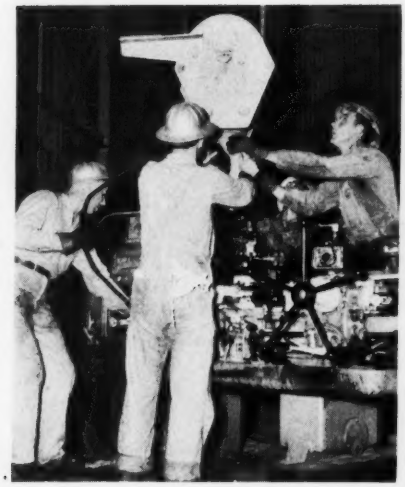
A BIG move got under way at Humble's Baytown Refinery late in August. Leading the procession were sturdy tractors which tugged at heavily-loaded equipment conveyors. From scattered locations throughout the refinery, men and equipment from the machine, welding, electric, and instrument shops began sharing their new home in the new central shop building.

Some sections of each of the four shops were kept in operation at their old locations until enough equipment had been installed in the new building to enable work to begin there. Then the rest of the equipment was transferred. This made it possible for plant maintenance to continue without interruption. Additional work space in the new building also made it possible to install some new time-saving machinery.

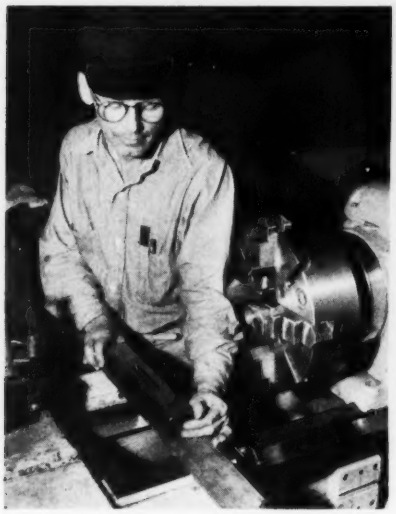
By mid-October, the moving was completed. But even before that, construction work had already begun on the second unit of the massive building which will permit other shops to move in until eventually all mechanical crafts will be brought together under one roof.

Intensive study of the best features of modern industrial shops preceded the building of Baytown Central Shop. The unit just completed is unique among structures of its type. In addition to the four work bays—each 72 feet wide—there is a bay in the center of the building which is 20 feet wide and four floors high. This is the nerve center of the shop. In it are located the offices, utility lines, locker and storage spaces, and sanitary facilities. Mercury vapor and incandescent lighting make the interior of the building bright enough to do any kind of precision work and help insure safe and efficient working conditions.

Baytown Central Shop is Humble's way of unifying most efficiently the work of the mechanical division—the many machines and skilled craftsmen needed to keep the busy refinery going.



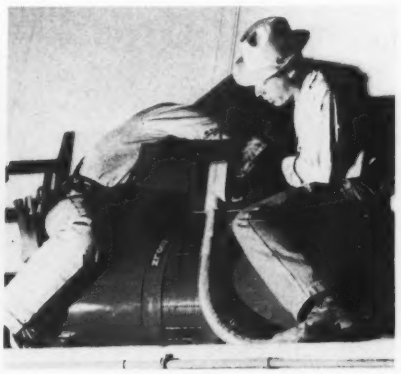
Steady hands and an overhead crane help ease a machine gently into place.



Leveling up follows installation of equipment. Below, new surface grinder aligns worn equipment fast, precisely.

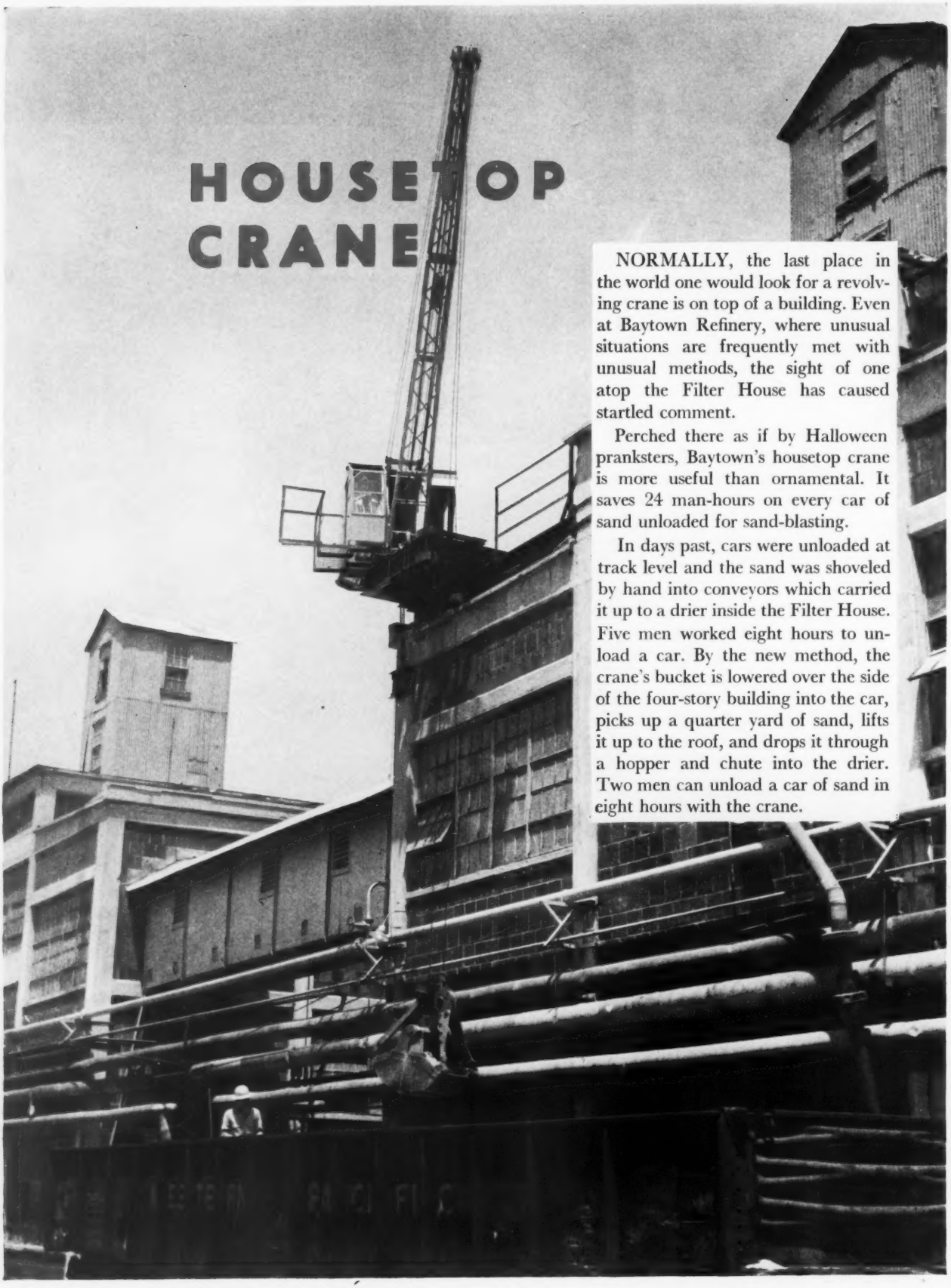
Telescoping platform which climbs from 12 to 35 feet at the touch of a lever and cannot be overturned makes the job of replacing burned-out bulbs easy and safe. In the background is shown the shop building's unique four-story nerve center.

Giant transformer will regulate the building's great electric power needs.



Electricians give help to welders by installing portable welding equipment.

HOUSETOP CRANE



NORMALLY, the last place in the world one would look for a revolving crane is on top of a building. Even at Baytown Refinery, where unusual situations are frequently met with unusual methods, the sight of one atop the Filter House has caused startled comment.

Perched there as if by Halloween pranksters, Baytown's housetop crane is more useful than ornamental. It saves 24 man-hours on every car of sand unloaded for sand-blasting.

In days past, cars were unloaded at track level and the sand was shoveled by hand into conveyors which carried it up to a drier inside the Filter House. Five men worked eight hours to unload a car. By the new method, the crane's bucket is lowered over the side of the four-story building into the car, picks up a quarter yard of sand, lifts it up to the roof, and drops it through a hopper and chute into the drier. Two men can unload a car of sand in eight hours with the crane.

THEY HAVE RETIRED

SINCE the last issue of THE HUMBLE WAY, 18 long-time employees of the Humble Companies have retired. All but one have more than 20 years service with the Humble Companies.

PRODUCTION DEPARTMENT

Francis C. Horner, Sr., district superintendent at Government Wells, retired on October 18 after more than 19 years service. He came with Humble as a clerk at Mexia and later worked at Wortham, Big Lake, Pyote, Hobbs, and Luling before moving to Government Wells.

Clint Williamson, pumper and gauger at Anahuac, retired on August 15 after almost 22 years service. On his first job with Humble, he was a carpenter at Hurdle. From there he went to Pyote, Hobbs, New Mexico, Kilgore, Arp, London, Gladewater, Conroe, and Tomball before moving to Anahuac.

BAYTOWN REFINERY

Thomas E. Marshall, janitor, retired on October 20 after 25 years service at the refinery where he started as a helper.

Henry N. McGrew, stillman first class, retired on August 4 after almost 24 years service. He began with Humble Pipe Line Company as a laborer at Dayton. Before transferring to the refinery on November 28, 1925, he had worked also at Valley Mills and Goose Creek.

Harry H. Mitchell, janitor in the Experimental and Testing Laboratory, retired on September 20 after more than 21 years service. He was a painter at McCamey Refinery before he transferred to Baytown Refinery on October 16, 1930.

Columbus Morgan, janitor, retired on October 3 after almost 22 years service with the refinery where he went to work as a helper.

Aron E. Sheffers, night superintendent of the Process Control Department, retired on August 6 after more than 29 years service at the refinery. He started as a tank painter.

J. W. "Skipper" Thomas admires testimonial book given at his retirement party. Left to right, W. A. Hugg, A. E. Payne, F. D. McMahon, C. C. Moore, O. Q. Lomax, Mr. Thomas, George Lee.

RETIREMENT PARTY FOR "SKIPPER" THOMAS

J. W. "Skipper" Thomas, West Texas division superintendent of Humble Pipe Line Company, was honored with a barbecue and retirement party by more than 400 friends and company associates on July 30 at Cloverdale Park in Midland.

Following a four-week vacation, Mr. Thomas retired on August 30 after 44 years of pipe lining and more than 30 years with Humble.

"Skipper" Thomas joined Humble Pipe Line Company in 1918 and had been a division superintendent for the past 23 years, shifting between the North and West Texas divisions and also managing operations in the Panhandle at different times. He lived in Wichita Falls for 14 years, in Cisco for seven years, and has lived in Midland since 1939.

He supervised construction of almost every major Humble pipe line in North and West Texas and also played an important part in building the efficient organization which carries on in those areas today.

HUMBLE PIPE LINE COMPANY

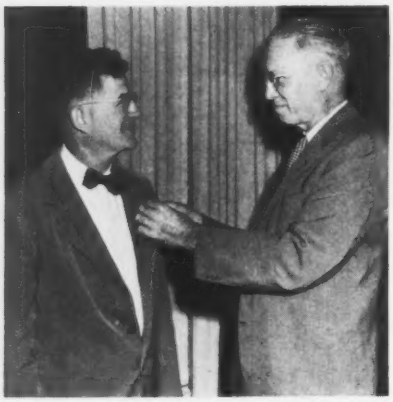
John F. Benedict, janitor in the Cisco Office, retired on October 1 after almost 25 years service. He came with Humble as a laborer at Chaney, and later worked at Putnam, Colony Creek, and Cisco before moving into the Cisco Office.

Dwight L. Hale, district clerk at Pampa, retired on September 1 after almost 23 years service. He was first a chainman and rodman at Wichita Falls, and later worked at Cisco, Nocona, Grosvenor, Colony Creek, Hobbs, New Mexico, Longview, Kilgore, Wink, and Odessa from where he went to Pampa.

George Hutton, water station engineer at McCamey, retired on September 8 after more than 25 years service. His career began as a laborer at Burkburnett Refinery. Later he worked at McCamey Refinery and at Hurdle in the Production Department. He transferred to Humble Pipe Line Company on April 1, 1936, as water station engineer at McCamey and held that position until his retirement.

(Continued on Page 28)

By the way...



President Hines H. Baker receives a 30-years' service pin from Board Chairman L. T. Barrow on October 3.

Robert O. Little, delivery man at Webster, retired on October 5 after almost 30 years service. He began with Humble as a laborer at Chilton before moving to Webster.

George F. Martin, chief engineer at May Station, retired on October 3 after almost 30 years service. Martin started out as a telegraph operator at Comyn and later worked at McCamey and Hawley before moving to May Station.

Herbert A. Smith, oiler at Truscott, retired on August 22 after more than 22 years service. He was employed as right-of-way foreman at Childress and later worked at Iowa Park, Truscott, and Rule before moving to Truscott.

James L. Stearns, telegraph operator, retired on October 11 after more than 22 years of telegraphy service. He worked first at Wichita Falls and later at Webster before moving into the Houston Office.

Houston Office

Mamie B. Fox, assistant secretary of Humble Oil & Refining Company, retired on September 25 after more than 30 years service. She began as a stenographer in the Treasury Department and also worked in the Operating Department before becoming assistant secretary.

Vera H. Hall, executive secretary, retired on September 8 after more than 20 years service. She was first a secretary in the Industrial Relations Department, and later worked in the Treasurer's Office before becoming an executive secretary.

Katharine H. Hogan, accounting clerk, retired on September 4 after more than 27 years service in the Sales General Office. She started to work with Humble as a bookkeeper.

Deaths

Fourteen active employees of the Humble Companies have died since the last issue of The Humble Way. These employees are:

Marvin F. Chandler, 40, laborer at Baytown Refinery, on August 9 . . . Milton Cormier, 37, special laborer at Baytown Refinery, on September 24 . . . Lucius E. Gardner, 62, watchman at Galveston Bay, on September 7 . . . Earl E. Goostree, 39, general clerk in Production Accounting, Houston Office, on September 15 . . . Paul S. Guinn, 49, roustabout at London Production, on August 18 . . . Frank B. Johnson, 34, research geophysicist in the Exploration Department, Houston Office, on September 29 . . . Charley C. Matthews, 64, locomotive engineer at Baytown Refinery, on September 3 . . . Harry F. McCandless, 55, pumper and gauger at Hawkins Production, on August 17 . . . S. J. Philpott, 60, senior yield clerk at Baytown Refinery, on September 5 . . . Tommie Pipkin, Jr., 28, porter at Clear Lake Gas Plant, on September 24 . . . Marion Reese, 36, oiler at Pettus pipe line station, on September 13 . . . William D. Slay, 41, burner at Baytown Refinery, on September 7 . . . Carey N. Spence, 34, electrician at Baytown Refinery, on September 3 . . . and Percy Willis, 56, pumper and gauger at Galveston Bay on August 13.

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Published every other month for employees and stockholders

HUMBLE OIL & REFINING COMPANY

P. O. Box 2180, Houston 1, Texas

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L. T. Barrow, *Chairman*

Hines H. Baker — Rex G. Baker

David Frame — H. W. Ferguson

D. B. Harris — Morgan J. Davis

J. A. Neath — C. E. Reistle, Jr.

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David Frame, *Vice President*

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Rex G. Baker, *General Counsel*

Gay Carroll, *Comptroller*

H. K. Arnold, *Secretary and Assistant Treasurer*

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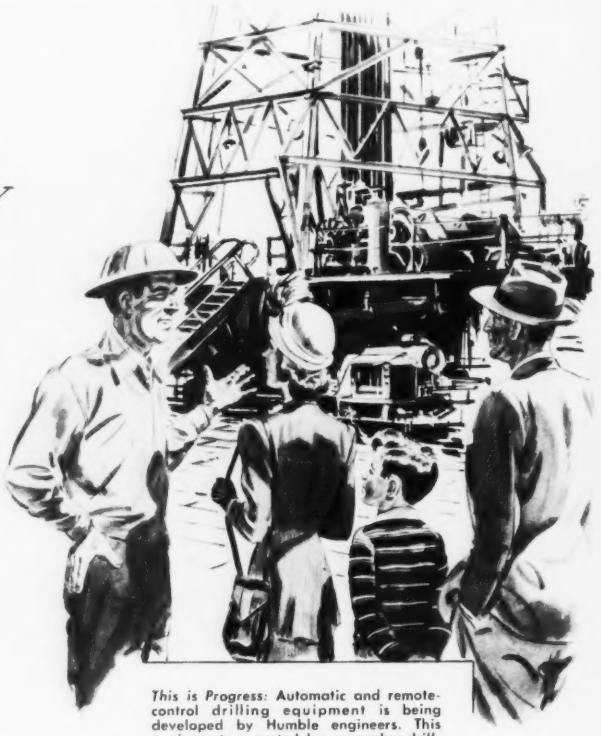
From their seats in the mobile control unit, the television director and his crew direct the cameramen and select the image to be televised. For the second year, Humble is televising experimentally a limited number of Southwest Conference football games.

direct
mble is
games.

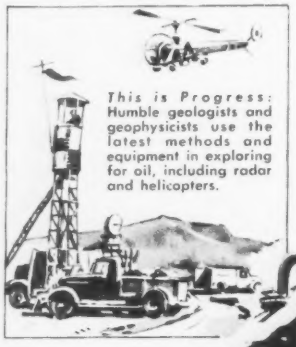
OIL PROGRESS WEEK • OCTOBER 16 - 22

This Week ...
Take a look at the industry behind the service station where you buy gasoline

The average American takes it pretty much for granted that the oil industry will supply him with dependable motor oils and gasolines for his car. His confidence is well placed. In the 90 years since the Drake well "came in" in Pennsylvania, oil has progressed from "rock oil," a medicine advertised as good for man and beast, to the great industry which today supplies not only gasoline and motor oil but also heating oils, rubber, house paint, insecticides, detergents, plastics, cosmetics, solvents, and a list of products too long for printing!



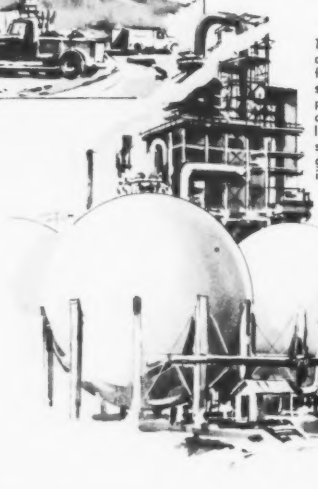
This is Progress: Automatic and remote-control drilling equipment is being developed by Humble engineers. This equipment, operated by a regular drilling crew, makes drilling easier, safer, and faster.



This is Progress: Humble geologists and geophysicists use the latest methods and equipment in exploring for oil, including radar and helicopters.

This year, during the week of October 16-22, the oil industry specially marks the great progress made since 1859 — *progress* evident in the scientific methods used in the search for oil; *progress* in the production and conservation of oil; *progress* in oil refining and the development of new petroleum products; *progress* in distribution which makes oil products available to every American.

The two million men and women of the industry recognize an obligation to the customers whose needs have made this progress possible, and to the nation which provided the encouragement of an enterprising spirit along every step of the way. In the discharge of that obligation, the oil industry looks at today's progress in terms of America's needs for tomorrow.



This is Progress: Scientists at Humble's Baytown Refinery are continuously seeking ways of improving processes and making new and better products. Catalytic cracking units, 20-stories high (in background), produce greatly improved gasolines.

This is Progress: Both crude oil and refined products are now transported rapidly and efficiently by extensive pipe line systems. Last year Humble Pipe Line Company handled 278 million barrels of crude oil and finished products in its 5,700 miles of trunk lines.

HUMBLE OIL & REFINING COMPANY